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PROBLEMS FOR SOLUTION.

ALGEBRA.

219. Proposed by Dr. SAUL EPSTEEN, The University of Chicago.

Sum to infinity $\frac{1.2}{3}+\frac{2.3}{3^2}+\frac{3.4}{3^3}+\dots\dots\dots$

220. Proposed by L. ROBINSON, B. S., Philadelphia, Pa.

Find the sum of the first $n+1$ terms of the series

$$1+\frac{m}{1!}+\frac{m(m+1)}{2!}+\frac{m(m+1)(m+2)}{3!}+\dots\dots\dots$$

221. Proposed by F. P. MATZ, Ph. D., Sc. D.

Eliminate the unknowns from

$$x/y+y/z+z/x=a\,\dots\dots\dots(1),\quad x/z+y/x+z/y=b\,\dots\dots\dots(2),$$
$$(x/y+y/z)(y/z+z/x)(z/x+x/y)=c\,\dots\dots\dots(3).$$

222. Proposed by G. W. WALKER, Camden, N. J.

Extract the square root of $87-12\sqrt{42}$.

GEOMETRY.

245. Proposed by J. H. M. MACLAGAN-WEDDERBURN, M. A., Chicago, Ill.

Given two lines of fixed length, $AB=a$, $BC=b$, perpendicular to each other. A line CP is drawn making $\angle BPC=\theta$. AD is the perpendicular to AB meeting CP in D. Find by Euclidean construction the angle θ such that $AD^2\cos^2\theta+b^2\sin^2\theta$ is a minimum.

246. Proposed by T. L. CROYES, Paris, France.

Given a movable point O on a fixed diameter of a circle S, an inscribed triangle ABC, and the perpendiculars OM, ON, OP from the point O on the sides AB, AC, BC. Prove, by pure geometry, that the circle circumscribing the triangle MNP will always pass through a fixed point.

247. Proposed by SETH PRATT, C. E., Tecumseh, Neb.

From two given points without a circle to draw two lines meeting in the circumference and making equal angles with the tangent at that point.

AVERAGE AND PROBABILITY.

131. Proposed by F. P. MATZ, Ph. D., Sc. D.

In a given square an arc is described at random the center being one of the vertices of the square. What is the probability that this arc is longer than a side of the square?

NOTE.—Problems and solutions in the departments of Geometry, Calculus, Mechanics, and Average and Probability should be sent to B. F. Finkel; and those in the departments of Algebra, Diophantine Analysis, Miscellaneous, and Group Theory should be sent to Dr. Saul Epsteen. Our contributors should carefully observe this notice if proper credit for contributions is to be given.